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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/512,882	02/25/00	BOUCKAERT	A 2750-198P
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EXAMINER

JOHANNSEN, D

ART UNIT

PAPER NUMBER

1655

DATE MAILED:

4  
12/06/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

## Office Action Summary

Application No.  
**09/512,882**

Applicant(s)  
**Bouckaert et al**

Examiner  
**Diana Johannsen**

Group Art Unit  
**1655**



☒ Responsive to communication(s) filed on Aug 15, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

### Disposition of Claims

☒ Claim(s) 1-40 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-40 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

### Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

### Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

☒ Notice to Comply

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## DETAILED ACTION

### *Specification*

1. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825 for the reason(s) set forth on the attached Notice To Comply With Requirements For Patent Applications Containing Nucleotide Sequence And/Or Amino Acid Sequence Disclosures. See, for example, pages 20-21 and 23-25 of the specification. Applicant is requested to return a copy of the attached Notice to Comply with the response to this Office action.
2. Claims 1-21 and 38-40 are objected to because of the following informalities. In the first line of claims 1 and claims 38-40, the phrase "method for isolating a from a target plant species..." should be amended to recite "method for isolating from a target plant species...". Appropriate correction is required.

### *Claim Rejections - 35 U.S.C. § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 1-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-28 and 37-40 are indefinite over the recitation of the term “identifying”. The specification does not provide a clear definitions of this terminology, and it is unclear as to what actual steps would be encompassed by this language. Particular, it is unclear as to whether a step of “identifying” would require an actual, active method step, or whether this language would encompass solely mental steps of “identification”. The claims should be amended so as to set forth active process steps.

Claims 1-28 and 37-40 are indefinite over the recitation of the limitation “the corresponding nucleotides” in (b)(i) of claims 21, 22, 23, 24, 28, and 37-40, and (i) of claim 4. First, there is insufficient antecedent basis for this language, as the claims do not previously refer to “corresponding nucleotides”. Second, it is unclear as to what types of relationships between nucleotides would be considered to constitute a “correspondence”. Clarification is required.

Claims 1-28 and 37-40 are indefinite over the recitation of the limitations “the most preferred codon” and “the desired amino acid” in (b)(ii) of claims 1, 22-24, 28, and 37-40, and (c)(ii) of claims 24 and 28. There is insufficient antecedent basis for these limitation in the claims.

Claims 1-21 are indefinite over the recitation of the limitation “the target plant class” in claim 21, (b)(ii). There is insufficient antecedent basis for this limitation in the claims.

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Claims 1-21 and 38-40 are indefinite for failing to recite a final process step that clearly relates back to the claim preamble. The claims are drawn to methods for isolating a “target polynucleotide encoding a target polypeptide”, yet recite a final process step of isolating a duplex. The claims do not set forth how isolation of a duplex results in isolation of a target polynucleotide. Accordingly, it is unclear as to whether the claims are intended to be drawn to methods for isolating a duplex or to methods of isolating a target polynucleotide.

Claims 4 and 6 are indefinite over the recitation of the limitation “the second most preferred codon”, “the target plant species” and “the desired amino acid” in claim 4, (ii). There is insufficient antecedent basis for these limitations in the claims.

Claims 4 and 6 are indefinite over the recitation of the phrase “The method of claim 1, wherein the oligonucleotide of step (b) wherein the sequence or its reverse complement...” in claim 4. This language is confusing, and it is therefore unclear as to how claim 4 is intended to further limit claim 1. Clarification is required.

Claims 7 and 10 are indefinite over the recitation of the term “each codon”. It is unclear as to whether this language is intended to refer to the “codons” recited previously in the claims, or whether this language is intended to refer to, e.g., each and every codon present in a sequence. Clarification is required.

Claim 15 is indefinite over the recitation of the phrase “aligning polynucleotides of plants..”. It is unclear as to whether this language is intended to refer to an actual, active method

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step of physically "aligning" molecules, or whether the claim may encompass, e.g., a mental process step of "aligning" sequences. Clarification is required.

Claims 22-23 are indefinite over the recitation of the limitations "those six codons" and "the target plant species" in (b)(ii). There is insufficient antecedent basis for these limitations in the claim.

Claim 22 is indefinite for failing to recite a final process step that clearly relates back to the claim preamble. The claim is drawn to a method for isolating a "target polynucleotide", yet recites a final process step of isolating an elongation product. The claim does not set forth how isolation of an elongation product results in isolation of a target polynucleotide. Accordingly, it is unclear as to whether the claim is intended to be drawn to methods for isolating an elongation product or to methods of isolating a target polynucleotide.

Claim 23 is indefinite for failing to recite a final process step that clearly relates back to the claim preamble. The claim is drawn to a method for identifying a "target polynucleotide", yet recites a final process step of determining the sequence of an elongation product. The claim does not set forth how determination of the sequence of an elongation product results in identification of a target polynucleotide. Accordingly, it is unclear as to whether the claim is intended to be drawn to methods for determining the sequence of an elongation product or to methods of identifying a target polynucleotide.

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Claims 24-28 and 37 are indefinite over the recitation of the limitation “the target plant species” in claim 24 and 28, (b)(ii) and (c)(ii), and claim 37 (b)(ii). There is insufficient antecedent basis for this limitation in the claims.

Claims 24-28 are indefinite over the recitation of the limitation “the corresponding position” in claims 24 and 28, (c)(i). There is insufficient antecedent basis for this limitation in the claims.

Claims 24-27 are indefinite for failing to recite a final process step that clearly relates back to the claim preamble. The claims are drawn to methods for isolating a “target polynucleotide”, yet recite a final process step of isolating a product. The claims do not set forth how isolation of a product results in isolation of a target polynucleotide. Accordingly, it is unclear as to whether the claims are intended to be drawn to methods for isolating a product or to methods of isolating a target polynucleotide.

Claim 28 is indefinite for failing to recite a final process step that clearly relates back to the claim preamble. The claim is drawn to a method for identifying a “target polynucleotide”, yet recites a final process step of determining the nucleotide sequence of a product. The claim does not set forth how determination of the sequence of a product results in identification of a target polynucleotide. Accordingly, it is unclear as to whether the claim is intended to be drawn to methods for determining the sequence of a product or to methods of identifying a target polynucleotide.

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Claims 29-36 are indefinite over the recitation of the terms “selecting” and “substituting”. It is unclear as to whether these terms refer to actual active method steps, or whether the claims may encompass, e.g., a mental process of “selecting” a sequence or “substituting” a nucleotide. The claims should be amended so as to set forth the actual active steps necessary to carry out the claimed methods.

Claims 29-36 are indefinite over the recitation of the term “desired amino acid sequence”. It is unclear as to what types of sequences might be encompassed by this language, and as to how a “desired amino acid sequence” would differ from any other “amino acid sequence”. Clarification is required.

Claims 29-36 are indefinite over the recitation of the limitation “the preferred codon”. There is insufficient antecedent basis for this limitation in the claims.

Claims 32-36 are indefinite over the recitation of the phrase “synthesizing an upstream oligonucleotide primer, or a portion thereof according to steps (b) and (c)”. As steps (b) and (c) of claim 31 do not refer to synthesis of an “upstream oligonucleotide primer”, it is unclear as to what is meant by this phrase.

Claims 33-36 are indefinite over the recitation of the limitation “said upstream and downstream primers”. There is insufficient antecedent basis for this limitation in the claims.

Claims 30 and 36 are indefinite for failing to recite a final process step that clearly relates back to the claim preamble. The claims are drawn to a method for “preparing an oligonucleotide primer for a polymerase chain reaction”, yet recite a final process step of synthesizing an

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oligonucleotide primer. The claims do not set forth how synthesizing a primer results in “preparation” of a primer for PCR. Accordingly, it is unclear as to whether the claims are intended to be drawn to methods for synthesizing a primer or to methods of “preparing” a primer.

Claims 31-36 are indefinite for failing to recite a final process step that clearly relates back to the claim preamble. The claims are drawn to a method for “cloning a nucleic acid”, yet recite a final process step of selecting/substituting nucleotides. The claim does not set forth how selecting/substituting nucleotides results in cloning of a nucleic acid. Accordingly, it is unclear as to whether the claims are intended to be drawn to methods for selecting nucleotides or to methods of cloning nucleic acids.

Claim 37 is indefinite for failing to recite a final process step that clearly relates back to the claim preamble. The claim is drawn to a method for isolating a “target polynucleotide”, yet recites a final process step of “generating a single strand polynucleotide”. The claim does not set forth how generating a “single strand polynucleotide” results in isolation of a target polynucleotide. Accordingly, it is unclear as to whether the claim is intended to be drawn to methods for generating single stranded polynucleotides or to methods of isolating a target polynucleotide.

Claim 38 is indefinite over the recitation of the limitation “the plant family of target plant species” in (b)(ii). There is insufficient antecedent basis for this limitation in the claim.

Claim 39 is indefinite over the recitation of the limitation “the plant genera for the target plant species” in (b)(ii). There is insufficient antecedent basis for this limitation in the claim.

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Claim 40 is indefinite over the recitation of the limitation “the plant species of the target plant species” in (b)(ii). There is insufficient antecedent basis for this limitation in the claim.

***Allowable Subject Matter***

5. The prior art does not teach or suggest methods for isolating or identifying polynucleotides encoding orthologues of a “template polypeptide”, or methods for cloning or selecting/preparing oligonucleotides, wherein the oligonucleotides employed meet the limitations of the instant claims. It was well known in the art at the time the invention was made to employ degenerate oligonucleotides and oligonucleotides conforming with codon preferences in the identification of orthologous/homologous molecules. For example, Sommer et al (Nucleic Acids Res. 17(16):6749 [1989]) discloses criteria for cloning homologous genes, teaching that one should select primers with perfect complementarity over the three, 3'-terminal bases, and otherwise conforming “with the preferred codon usage of the organism” (p. 6749). Peretz et al (Anaerobe 3(4):259-270 [1997]) teach the use of degenerate oligonucleotide probes in both hybridization and amplification methods to achieve identification of homologous proteins in thermophilic and mesophilic bacteria (see, e.g., p. 261). With respect to the cloning of *Leishmania* genes, Langford et al (Experimental Parasitology 74:360-361 [1992]) disclose that one should “consider the striking codon preference in *Leishmania*”, noting in particular a strong preference for G/C in the third codon position, and teaches the use in cloning *Leishmania* genes of oligonucleotides with “relatively low degeneracy” that take this codon preference into account.

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However, the prior art does not provide sufficient guidance to suggest to one of ordinary skill in the art any advantage in selecting oligonucleotides meeting the particular limitations of the instant claims, that is, oligonucleotides that comprise at least 4 codons encoding a portion of a conserved region in a "template polypeptide", wherein "the sequence of the first and second positions of at least three of the codons is the same as the corresponding nucleotides in nucleotides in the template polynucleotide" and wherein "the nucleotide at the third position" of these codons "is the nucleotide of the third position of the most preferred codon" of the class "for the desired amino acid". The specification discloses that the use of such modified oligonucleotides allows one to amplify orthologous sequences from different plant families in cases in which primers used successfully with "template" nucleic acids cannot be used successfully in amplification of orthologous sequences (see, e.g., p. 22, 25 of the specification). Further, with respect to the subject matter of claims 29-36, the prior art does not teach or suggest selecting preferred codons for the third codon position only if the third base is G or C and substituting G/C for A/T in cases wherein A or T is the preferred codon.

### *Conclusion*

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Diana Johannsen whose telephone number is 703/305-0761. The examiner can normally be reached on Monday-Friday from 7:00 a.m. to 3:30 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones, can be reached at 703/308-1152. The fax phone number for the Technology Center where this application or proceeding is assigned is 703/305-3014 or 305-4242.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703/308-0196.

Diana Johannsen

December 1, 2000

  
W. Gary Jones  
Supervisory Patent Examiner  
Technology Center 1600  
12/4/00